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09/936,092	09/07/2001	Xiabin Bai	13479-002001	9194
26161	7590	06/30/2004	EXAMINER	
FISH & RICHARDSON PC 225 FRANKLIN ST BOSTON, MA 02110			ELKASSABGI, HEBA	
			ART UNIT	PAPER NUMBER
			2834	

DATE MAILED: 06/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/936,092

**Applicant(s)**

BAI ET AL.

**Examiner**

Heba Elkassabgi

**Art Unit**

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03/12/2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09/07/2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### ***Drawings***

The drawing objection is withdrawn in light of applicant's remarks.

### ***Specification***

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Objections***

**The Examiner respectfully requests that the Applicant further review the claim terminology for proper grammar. The claims are generally narrative and indefinite, failing to conform to current U.S. practice. They appear to be literal translation into English from a foreign document and are replete with grammatical and idiomatic errors.**

1. Claims 1-11 are objected to because of the following informalities: The use of passive voice is awkward "the rotor is of p-m" and that the term "p-m" needs to be disclosed in a full clear and concise manner as to one skilled in the art may understand. Appropriate correction is required.

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2. Claim 1 is objected to because of the following informalities, in which the suggested reading of the claim is as follows: "the rotor is [of] a permanent magnet, [of] electric excitation, or [of] induction, and includes 8 or more poles, and an armature [is] winding formed by solid wires and [is] arranged in layers in [into] a slot of the stator to form a wave winding with an equal or unequal pitch, wherein each turn of said winding in the slot contacts the wall of an iron core of the stator." Appropriate correction is required.

3. Claim 2 is objected to because of the following informalities, in which the suggested reading of the claim is as follows: "armature winding is a wave winding not [without being] lapped at the extension." Appropriate correction is required.

4. Claim 5 is objected to because of the following informalities, in which the suggested reading of the claim is as follows: "armature winding is located in the slot with a single strand of the wires in each layer and both [two] sides of the wires contact the wall of the iron core." Appropriate correction is requested.

5. Claim 6 is objected to because of the following informalities, in which the suggested reading of the claim is as follows: "armature winding is located in the slot with a double strand of the wires in each layer....". Appropriate correction is requested.

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6. Claim 7 is objected to because of the following informalities, in which the suggested reading of the claim is as follows: "a phase winding [is resulted] **formed** by m..." and "same direction and [not being] are not lapped at..". Appropriate correction is requested.
7. Claim 8 is objected to because of the following informalities, in which the suggested reading of the claim is as follows: "'where m is the number of phasess and k is the number of slotss occupied...". Appropriate correction is requested.
8. Claim 9 is objected to because of the following informalities, in which the suggested reading of the claim is as follows: "by m windings and [are] overlap[ped] each other...". Appropriate correction is requested.
9. Claim 10 is objected to because of the following informalities, in which the suggested reading of the claim is as follows: "rotor is of electric [exciting] **excitation;** the slotss..". Appropriate correction is requested.
10. Claim 11 is objected to because of the following informalities, in which the suggested reading of the claims as follows: "L [is met] **is determined by the equation**". Appropriate correction is requested.

11. Claim 13 is objected to because of the following informalities, in which the suggested reading of the claims as follows: "surface wave winding [without being] not lapped at the..." and " surface in[to] a single layer and [occupies] occupy a width of a phase belt...". Appropriate correction is requested.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

1. Claims 7 recite the limitation "the different phase" in line 4. There is insufficient antecedent basis for this limitation in the claim.
2. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim limitation of "windings can be obtained by translating said m windings on different layers" is not clear if this refers to a possible means of obtaining the claimed structure or a definite limitation. Appropriate correction is requested and no new matter should be entered.
3. Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim limitation of "and to come back to the original

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extension from another k slots there they are not lapped" this is a vague and indefinite confusing language and "may be obtained" is not clear if this is just a possible method of manufacturing. Appropriate correction is requested and no new matter should be entered.

4. Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. "Each pole occupies one slot", how can a pole occupy a slot and "wave winding winded" is not clear as to the term winded, the correct claim terminology as understood from the specification should be "wave winding wound or comprising a single strand or double-strand". No new matter should be entered.

5. Claim 11 recites the limitation "tooth slot" in line 2. There is insufficient antecedent basis for this limitation in the claim. Tooth and slot are two different elements. Appropriate correction is requested and no new matter should be entered.

6. Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The equation of " $L_{xtg}(g) \leq 2T$ " is indefinite because the parameter "t" is undefined.

7. Claims 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim limitation is not clear if the stator or rotor has 8 or more poles, For purpose of examination the examiner as understood interprets that the rotor core has 8 or more slots and that the stator is slot less. In addition, how can the "armature windings is arranged on the surface of the winding".

8. Claims 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim limitation is not clear of "from crossing vertically" is vague and indefinite the term crossing is defined as "across" and the term vertically is "situated at a right angle". In addition the claim limitation of "without being lapped" is a dangling participle clause, it is not understood as to what is being lapped, for purpose of examination the examiner interprets that the wave winding is not being lapped. Appropriate correction is requested and no new matter should be entered.

9. Claims 14 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim limitation is not clear of "lapped at the extension; and said m phase windings are obtained by translating said surface wave winding with k strands of wires and are lapped each other at the extension," these two limitations contradict each other. No new matter should be entered.



10. Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term “p-m” in claim #1 is used by the claim to mean “permanent magnet” as understood in the specification to be however the accepted terminology for purpose of prosecution is the full written term of “permanent magnet”. The term is indefinite because the specification does not clearly redefine the “p-m” term.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Bechberger et al. (US Patent 2550663).

Bechberger et al. a multiple-pole electric machine having a rotor (1) and a stator (2), of electric excitation and having 8 or more poles (as in figures 1&2). An armature winding (stator winding 4) is formed by solid wires and is arranged into layers in a slot of the stator to form a wave (harmonic) winding with an equal pitch. Wherein, each turn of the winding (4) in the slot contacts the wall of an iron core of the stator (2).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 2-6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bechberger et al. (US 2550663) as applied to claim 1 above, and further in view of Maeda et al. (US Patent 6604272) and In re Aller.

Bechberger et al. Discloses the claimed invention of an electric motor having a rotor with more than 8 poles and a stator with more than 8 poles having a wave winding. In regards to claim 7, each rotor pole has "m" slots and that a phase winding is resulted by "m" windings on each layer and the are arranged to cross "m" close to or lying to near to slots in the same direction, in which the different phase windings can be obtained by translating the "m" windings on different layers. In regards to claim 8, where "m" is the number of phase windings and "k" is the number of slot occupied by one phase belt (winding); each phase winding comprises "k" windings, and that "k" windings are arranged to cross "k" slots from one extension in the same direction, to cross one pole span without being lapped at the other extension, and to come back to the original extension from another "k" slot. In regards to claim 9, each pole has "m" slots and the "m" phase windings are formed on each layer by "m" windings. However, Bechberger et al. does not disclose a not lapped or partially lapped winding or a single or double strand.

Maeda et al. discloses in regards to claim 2-3 an armature winding (stator winding 23) without being lapped or partially lapped at the extension (see column 3, lines 9-43, being integrally connected). In regards to claim 4, an armature winding (stator winding 23) is a pole-pitch winding. In regards to claims 5 and 6, the armature winding (stator winding 231a-b, 232a-b) is located in the slot (25) with a single strand of the wires (23) in each layer and both two sides of the wires contact the wall of the stator iron core (22) (see figure 11). In regards to claim 10, the rotor is an electric exciting rotor and the slot of the iron core are straight each pole occupies one slot and than the winding is a single strand or double strand of solid wires and is not lapped at the extension.

It would have been obvious to one of ordinary skill in the art to combine the reference of Bechberger et al. structure of the rotor and the stator with the structure of Maeda et al. of the armature winding in which would be apparent to one skilled in the art without departing from the ~~scope~~<sup>scope</sup> of the invention that various forms and relative arrangements would further improve electrical generation.

In regards to claim 8, Bechberger et al. and Maeda et al. discloses the claimed limitations except for the number of slots belonging to each pole of the iron core is  $m \times k$ , and all  $m$  phase windings on each layer may be obtained by translating said phase winding comprising  $k$  windings by  $n \times k$  slots, where  $n$  is an integer. It would have been obvious to one having ordinary skill in the art at the time the invention was made to choose a preferred range, since it has been held that where the general conditions of a

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claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller. 105 USPQ 233.

In regards to the claim limitation of claim 11, Bechberger et al. and Maeda et al. discloses the claimed invention except for the length of the iron core being where, L is met:  $L \times t \times g \times 2T$ , where T is the tooth pitch, g is an inclined angle. It would have been obvious to one having ordinary skill in the art at the time the invention was made to choose a preferred range, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller. 105 USPQ 233.

2. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bechberger et al. (US 2550663) and Maeda et al. and In re Aller as applied in claims 1-11 above and in further in view of Hibino et al. (US. Patent 5313131).

Bechberger et al., Maeda et al., and In re Aller discloses the claimed invention of an electric motor having a rotor with more than 8 poles and a stator with more than 8 poles having a wave winding and that the wave winding are lapped or partially at the extension. However Bechberger et al., Maeda et al. and In re Aller do not disclose a slot less stator.

Hibino et al. discloses in figure 1 a frame (2) having a rotor (1) and a stator (4) in which the stator is slot less with coil windings in which the strands are arranged side by side in the same vertical direction to transversely cross the surface of the iron core from

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the lower extension to the upper extension from crossing vertically the surface of the iron core.

It would have been obvious to one of ordinary skill in the art to combine the motor structure of Bechberger et al. and Maeda et al. with the slot less stator of Hibino et al. in order to form revolving magnetic fields in the stator cores.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-14 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

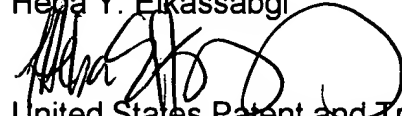
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Heba Elkassabgi whose telephone number is (571) 272-2023. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on (571) 272-2044. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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Heba Y. Elkassabgi



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